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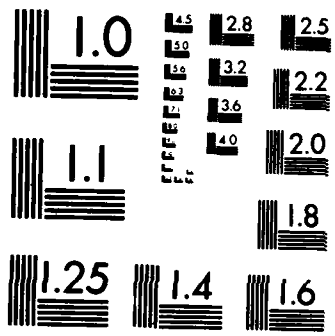


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Effects of information load on satisfaction as modified by TypeA vs. Type B and by Cognitive Complexity were investigated. Satisfaction decreased with increasing task difficulty (load) but was particularly low for persons of Type A and cognitive simple styles. Similar results were obtained for a measure of Enjoymenbt Despite Dissatisfaction which accounted for motivation in the face of challenge. Relationships between job and task satisfaction are considered.

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# Effects of Load, Cognitive Complexity and Type A on Satisfaction

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The conceptualization, definition and application of the term "satisfaction" have been of considerable interest to organizational psychology for quite some time. Reviews of the area have, however, shown that our understanding of conditions which produce satisfaction or dissatisfaction are quite limited (e.g., Brayfield and Crockett, 1955; Bruggemann, Groskurth and Ulich, 1975; Fournet, Distefano and Pryer, 1966; Herzberg, Mausner, Peterson and Capwell, 1957; Hoppock, 1935; James and Jones, 1980; King,1970; Locke, 1976; Mitchell, 1974, Neuberger, 1974; Schwab and Cummings, 1970; Smith and Cranny, 1968, Vroom, 1964; Wanous and Lawler, 1972; Weinert, 1981; Weir, 1976; Wernimont, 1972).

Part of the reason for the encountered difficulties may be the inherent complexity of this research area: apparently satisfaction and dissatisfaction are modified by the interaction of a multitude of factors, many of which are only active throughout a partial range of the satisfaction-dissatisfaction dimension. Another reason, however, may have been a repeated shift in focus by organizational psychologists and other scientists who have considered the study of satisfaction to be variably useful in the service of changing values and orientations. For example, satisfaction has been viewed as important because (1) it was assumed to be directly

related to productivity, (2) it was assumed to have an ameliorating effect on turnover, (3) it was viewed as related to organizational climate, (4) it was assumed to respond to leadership style, (5) in a more democratic organization, the feelings and attitudes of employees were considered of importance, (6) differential goals of employee subpopulations were to be considered for a number of reasons, and (7) quality of worklife was to be improved. With the exception of turnover, most of these research orientations did not produce reliable or simple relationships between satisfaction and the particular organizational phenomenon of interest. For example, Vroom's (1964) analysis of the literature generated correlations between satisfaction and performance in a range from -.31 to +.80 with a median value of +.14. Apparently, a number of moderator variables must be at work. For example, Bhagat, (1982) and Ewen (1973) have pointed toward pressure to perform as a condition which modifies the satisfaction-performance relationship. Other moderator variables appear to influence satisfaction as it responds to the organizational phenomena listed earlier.

The present research will focus on individual differences under various task loads as predictors of task satisfaction. Although it has been frequently recognized that individual differences should be related to satisfaction (e.g., Brayfield and Crockett, 1955; Schaffer, 1953), theoretical orientations which focus on the individual (e.g., Alderfer, 1969, 1972; and the utilization of Maslow's, 1943, theory) and research efforts directed at the individual (e.g., Downey, Hellriegel and Slocum, 1975; Mehrabian and West, 1977) are much more rare than theory and research focused on, for example, the performance-satisfaction relationship. Research on individual differences in cognitive style, as they relate to satisfaction, have been particularly neglected.

That neglect is quite surprising since stylistic variables have been shown to be very useful in predicting important differences in individual and group task performance (e.g., Streufert, 1978; Streufert, Streufert and Denson, 1982). The present research effort will relate two well established cognitive/perceptual styles to the satisfaction concept: Type A Coronary Prone Behavior and Cognitive Complexity.

## Type A Coronary Prone Behavior

Rosenman and Friedman (c.f. Rosenman, 1978) observed that certain stylistic characteristics of their patients were predictive of heart disease: hostility, time urgency, competitiveness, and so forth. The person who displayed the majority of these characteristics in response to challenge was labeled "Type A". Persons lacking these characteristics were classified as "Type B". Considerable subsequent research by a host of investigators has established the Type A style as indeed predictive of cardiovascular disease. As a rule, the Type A person believes that he or she must engage in that particular style to be successful in work and/or task settings. Research by Streufert and associates (e.g., Streufert, Streufert and Gorson, 1981) suggests that this assumption is probably not justified.

The Type A person is easily challenged. One would predict that his or her behavior in response to difficult yet challenging tasks would be the investment of additional effort (without necessary improvements in consequent performance). Competitive success, whether against another person's performance or against oneself should be of major importance to the Type A; consequently, one would expect that satisfaction (with performance) of such an individual would likely be depressed, when compared to his of her Type B counterpart. However, the potential dissatisfaction with performance might not generalize to an enjoyment of the task since challenge is exciting and

activating to the Type A. In other words, while satisfaction with own performance may be expected to decrease with increasing (excessive) task difficulty, enjoyment of the task might even be expected to increase for Type A persons. Further, one might expect that the predicted differences between Type A individuals and Type B individuals may become even greater as task difficulty increases toward more and more difficult and challenging levels (unless, of course, levels are reached where both the Type B and the Type A have "given up" in the face of an impossible level of challenge).

Cognitive Complexity (Multidimensionality)

Previous research has shown that the more cognitively complex (more multidimensional) person is a better strategist and better planner. However, he or she may not necessarily be as effective when there is a need to respond immediately and decisively (Streufert, Streufert and Denson, 1982). Generally complex persons consider more dimensions when perceiving their environment. This characteristic can be important when a person is judging the impact of challenges on expectations of performance. The less complex, i.e. more unidimensional person tends to be more subject to the salience inherent in any task setting: he or she is more likely to focus on the challenge component of a task. Lack of sufficient success, when challenged, may express itself in task dissatisfaction. On the other hand, one may expect the more multidimensional person to be more satisfied in the face of a difficult task: he or she will not only consider current levels of (possibly inadequate) performance, but will also evaluate performance in light of the difficulties encountered. However, the perceived enjoyment of a task may not parallel satisfaction: the more unidimensional person may be expected to enjoy the challenge more than the more multidimensional person who would probably be

more aware that his or her performance cannot reach high levels as task difficulty becomes excessive. Again, one would expect the differences between complex (more multidimensional) and less complex (more unidimensional) persons to become greater as the difficulty level of the task increases toward levels where adequate performance is less and less achievable.

Task Difficulty: Load

Load is a frequently utilized variable in both social and organizational psychology. While it has been repeatedly demonstrated that load has clear effects on performance in a wide variety of task settings (e.g., Bartlett and Green, 1966; Chiles and Alluisi, 1979; Drabeck and Haas, 1969; Jacoby, 1974, 1977; Kelly and Fiske, 1951; Malhorta, Jain and Lagakos, 1982; Miller, 1978; Quastler and Wulf, 1955; Stager and Muter, 1971; Streufert, 1970.), attempts to relate load to satisfaction have been somewhat less successful (e.g., Jacoby, Speller and Kohn, 1974; O'Connell and Cummings, 1976), particularly when performance was expected to relate positively to satisfaction. Nonetheless, one would assume that satisfaction with task performance should be directly affected by experienced load. If enjoyment of a task or job can be viewed as another, somewhat different, measure of satisfaction, no such direct relationship might be expected where challenge is a mediating variable between the two concepts. Enjoyment, at least for some persons, may be more a function of challenge than of task difficulty (load).

In the present experiment load will be varied in a visual-motor task which has been extensively utilized to measure task performance as a function of varying load levels. Load will be increased from moderate to high challenge levels which have been shown previously to produce decrements

in a number of task performance measures (c.f. Streufert and Streufert, 1982) and increments in physiological (stess-related) reactivity. One would expect that satisfaction with task performance, in general, would decrease as increasing load levels may make acceptable levels of task performance more and more difficult to achieve. One might further expect that increasing challenge might increase enjoyment to some extent, particularly for persons who are classified as Type A or as less Cognitively Complex (more unidimensional).

## METHOD

Forty-two employed adult males* participated as individuals in a series of interviews and tasks. Subjects remained in the laboratory for approximately four to five hours each. The research included a complexity interview, a Type A interview and a visual-motor task (discussed below). Upon arrival at the laboratory each subject was briefed about the forthcoming events and the subject's signature on a consent form was obtained. The subject was then taken to the laboratory rooms where data were collected (see below).

### Complexity Interview

The subject was comfortably seated and handed a set of cards by an experimenter. Each card contained the stem of a sentence (e.g., when someone competes with me...). The subject was asked to complete the sentence and to continue talking about the topic. Topics were specific to various

*Because of greater availability only male subjects participated in this research. Generalization of the obtained data to females should be made only with extreme caution.

cognitive domains listed by complexity theorists. After the subject finished the initial responses to any one card, the experimenter asked several non-leading questions, designed to encourage the subject to (a) continue responses to the topic at hand, and (b) reveal the cognitive dimensionality on which the responses were based. When the subject's repertoire of responses to a topic was exhausted, he was asked to continue with the following card. A total of twelve cards were presented. The procedure is designed to assess level of cognitive complexity and represents an interview version of the sentence completion test (SCT, in some versions also called paragraph completion test) developed by Schroder and Streufert (1963) and Schroder, Driver and Streufert (1967). Reliability and validity of the test is excellent (c.f., Streufert and Streufert, 1978).

Type A Interview

The Structured Interview (S.I.), designed by Rosenman and Friedman to assess Type A behavior (c.f., Rosenman, 1978), was administered by a different experimenter since it was necessary to avoid the subject beginning the interview with any previously established impressions of the interviewer. The interview represents a standardized social challenge situation considered by many to represent considerable social stress. The experimenter interviewing the subjects was trained by Rosenman. Responses to both interviews were videotaped. Both interviews were scored by at least two experimenters, each with extensive training in these methods. Scorers of the Type A interview were trained by Rosenman. Scorers of the complexity interview were trained by Streufert. Disagreements greater than one point discrepancies on the respective scales did not occur.

Visual-Motor Task

A visual-motor task, previously developed by Streufert and Streufert (1982), was utilized in this research. The task uses the format of a video game, not unlike the familiar Pac-Man. In contrast to other video games, however, the speed of movement and the number of antagonists (stressing load) can be precisely varied in several steps. The game utilizes a series of concentric passageways that are filled with a number of squares which the subject is to "scoop up" with a horseshoe-shaped object that he is able to move by operating a handle on a small box placed on the subject's desk. The matrix of passageways is presented in Figure 1. The subject begins with a score of five points. Scooping up one square adds five points to the score. Moving through one unit of empty space between the squares subtracts one point from the score. In other words, a continuous movement through spaces filled with squares would add 5-1=4 points for each square collected. Moving through spaces where no squares are present would subtract one point for each empty space, including those spaces previously occupied by squares. In other words, to obtain as high a score as possible, it is useful to avoid moving through blank spaces, i.e., to move so that as many squares as possible can be picked up in one more or less continuous series of moves. Movement is possible only through passageways. Movement across solid lines is not possible.

In addition to the squares, from one to eight dots (differently colored) can appear in the matrix shown in Figure 1. The dots move randomly along the passageways of the matrix, reversing their direction (again randomly) from time to time. The dots are to be avoided: colliding with them is

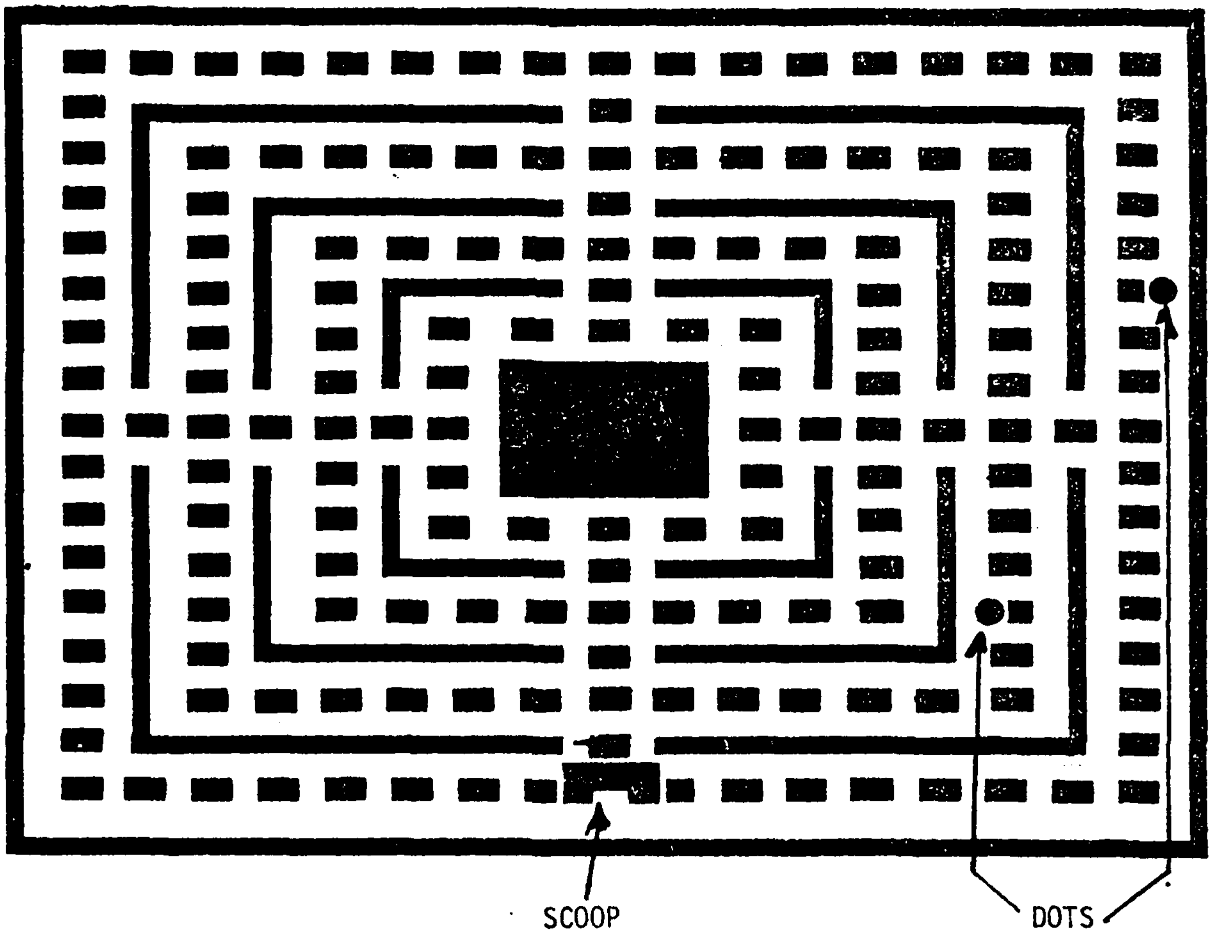


FIG. 1. TASK MATRIX

considered an error, costing the subject 100 points for each collision. A collision removes the dot to a different random position in the matrix so that a second collision due to the same error is highly unlikely.

The computer program permits the experimenter to systematically vary a number of characteristics which apply during any one task period. The characteristics which can be modified are: (1) the speed of movement for both the subject's scoop and the dots which the subject is to avoid. Speed can be increased or decreased in four equal interval steps; (2) the number of dots on the screen (varying from one to ten); and (3) a constant score (displayed on the screen throughout any task period). The score reflects an experimenter-selected value indicating either the supposed average score obtained by other subjects on their first try or (optionally) the highest score obtained by any subject. In addition, the experimenter is free to select the number of task periods which are to be employed. Each period lasts until the subject has successfully scooped up all the squares from the matrix on the video screen. The subject's current score is continuously and prominently displayed at the bottom of the screen. As stated, the subject's current score starts at +5 and increases as more and more squares are captured. It decreases with collisions with dots and movement through blank spaces. The score may become a negative value if the subject moves through blank spaces 2.5 times more often than through spaces still occupied by squares or if he repeatedly loses blocks of 100 points by collisions with dots.

Instructions to Subjects

Subjects were instructed in detail via video tape about the operation of the task. They were reminded to avoid collisions with white dots.

They were also told about the loss of points created by moving through blank spaces. They were further asked to try to do as well as possible, to avoid letting scores drop below zero, and to try hard again during the next task period if they are not as successful as they might wish during any previous period. While the subjects were reminded of the consequences of failing to use strategy, they were not told what strategy should be used to obtain maximal scores. Instructions were moderately challenging, and can be considered somewhat below the challenge and competition level induced by Dembroski, MacDougall, Shields, Petitto and Lushene (1978). The level of challenge and competition selected for these instructions was based on a representation of work environments rather than of experimental environments. Subjects were told to expect different speed levels and different numbers of dots to be avoided from one game period to another. The actual number of periods that would be played was not specified in advance.

## Load Manipulation

Subjects were initially given a practice try to familiarize themselves with the task and to eliminate or decrease the potential effects of previous experiences with video games* For the practice task, speed was held at level 1 (low). Only one dot was presented in the matrix. After completing this task period (and after all other subsequent periods), subjects responded to a number of seven-point scales (manipulation checks). After completing the scales, the subject was asked whether he was ready to

*Previous experience with video games, in general, and with Pac Man specifically, did not affect performance.

try the task again. All subjects responded positively in all cases.

All subjects participated in four task periods following the practice period. The number of dots, representing the load manipulation,* was systematically varied for these four periods. Either 2, 4, 6 or 8 dots were placed into the matrix. Order of presentation was based on random sequences checked via a counterbalancing procedure to assure that specific load levels would not occur inordinately often at any sequence position. Speed for all four task periods was held at level 2 (moderate). Subjects were not aware of what their next load level would be until the matrix with the relevant number of dots appeared on their screen at the beginning of the task period.

A read-out at the bottom of the video-screen informed subjects during the first (practice) period that the average score obtained by other subjects during their first try had been 435. That score level was rather easy to achieve and was surpassed by all but two of the subjects in this research. For the following four task periods, the subscript on the screen indicated that the highest score obtained by any subject so far had been 898. None of the subjects achieved or surpassed that score.

The performance of all subjects in response to tasks at all load levels was video-taped for later analysis. Data were based on performance scores for the four periods following the practice period. Order of presentation of this task and the interviews was varied to eliminate potential sequence effects.

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*In complex tasks (e.g., Streufert, 1970) load was defined as the number of information (stressor) items per unit time. Load in the present task has a quite similar meaning. While time is held constant, the subject had to attend to the number of antagonistic dots in the matrix, representing levels of loading stressor conditions.

## Measurement of Satisfaction and Related Concepts

Shortly after arrival at the laboratory, subjects were asked to respond to the following questions on seven point scales: (1) How satisfied are you with the job you are holding now or, if you are not working, with the job you most recently held? and (2) How satisfied are you with the level of the job? Direction of the scale (from 1 - 7) was inverted in half the cases but transformed to 7 = completely satisfied and 1 = not at all satisfied for purposes of data analysis.

Following each of the load periods in the Visual-Motor Task, subjects again responded to a number of scales. The following questions were asked: (1) How difficult did you find the game you just played (very easy to very difficult), (2) How satisfied are you with your performance for the game you just played (completely satisfied to not at all satisfied, and (3) How enjoyable was the game you just played (very enjoyable to not at all enjoyable). Seven-point scales were again employed, transformed for analysis so that the value of seven indicated very difficult, completely satisfied or very enjoyable. Responses to these scales formed the basis for data analysis.

# RESULTS AND DISCUSSION

## Manipulation Check

The task difficulty scale was analyzed via Analysis of Variance with three factors: Complexity (two levels, between), Type A (two levels, between) and Load (four levels, within). Only the load factor resulted in a significant F ratio ($F = 38.68$, 3/111 df, $p < .001$). Rated difficulty increased significantly with each successive increase in load. The data

are presented graphically in Figure 2. The manipulation employed in the research can be viewed as highly successful.

Task Satisfaction

Data obtained on the task satisfaction scale were analyzed via a three-way mixed design (2b x 2b x 4w) Analysis of Variance. Main effects for Complexity ($F = 18.26$, 1/37 df, $p < .001$), Type A ($F = 25.29$, 1/37 df, $p < .001$) and Load ($F = 26.93$, 3/111 df, $p < .001$) were highly significant. A significant Complexity by Load interaction effect was obtained ($F = 3.82$, 3/111 df, $p = .012$). The Load by Type A interaction was marginally significant ($F = 2.35$, 3/111 df, $p = .075$). The three-way interaction term failed to approach significance ($F = 1.05$).

It appears that Type A and Cognitive Complexity have separate effects on task satisfaction*. In light of this finding, the data for Type A/B and for Complexity are presented separately in Figure 3. As can be seen from a view of that figure, satisfaction in general decreases with increasing load. It should be noted, however, that the stepwise decreases are no longer significant after load level 4 has been reached. An insignificant increase in satisfaction between loads 4 and 6 may point to the necessity of additional future research. Clearly, the satisfaction level of complex (more multidimensional) persons exceeded that of their less complex (more unidimensional) counterparts and the satisfaction level of Type B persons was higher than that of Type A persons. Both findings support the predictions advanced earlier in this paper. Moreover, the predicted increasing discrepancy with increasing load between more complex (multidimensional) and less complex (more unidimensional) persons

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* Type A and Cognitive Complexity are typically uncorrelated.

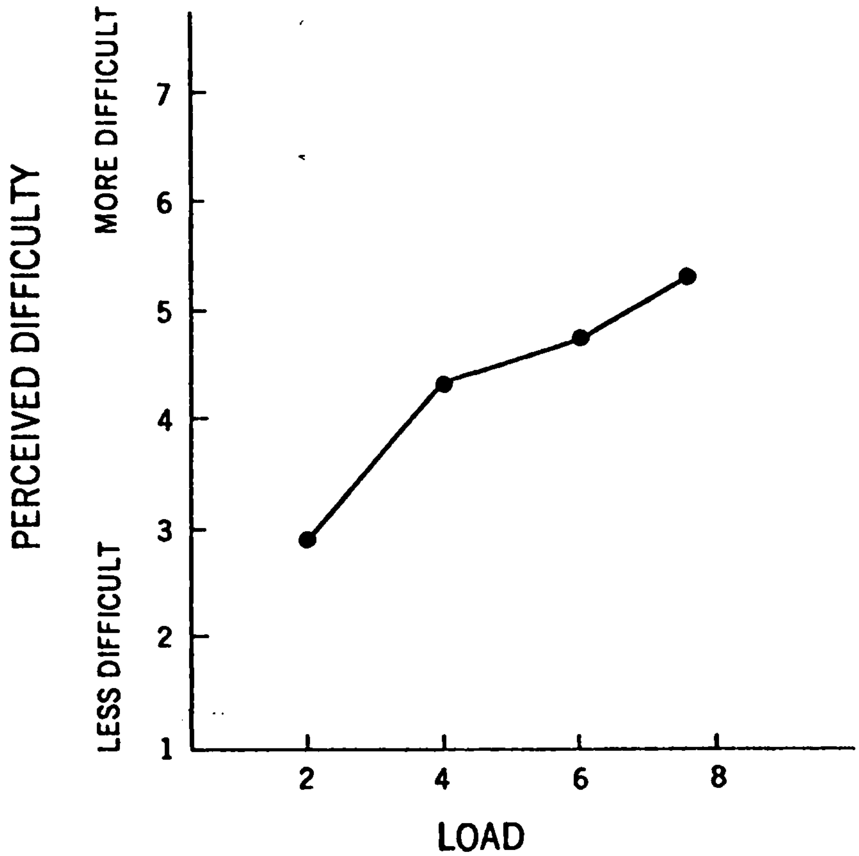


Fig. 2. Effects of Load on Perceived Task Difficulty

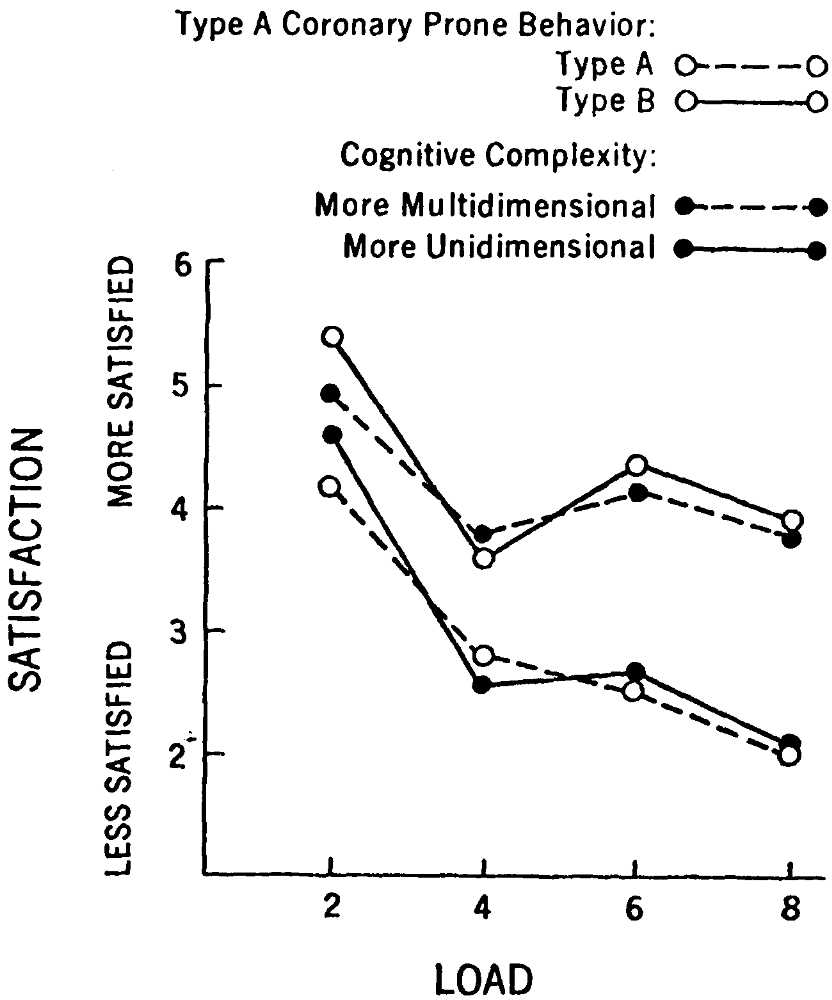


Fig. 3. Effects of Load, Type A and Cognitive Complexity on Task Satisfaction

($p < .05$) is evident in the graph. Equally visible, although only marginally significant, ($p < .10$) is an increasing discrepancy between Type A vs. Type B persons.

Enjoyment Despite Dissatisfaction

The data for satisfaction indicated that participants in the research, particularly less complex (more unidimensional) persons and persons identified as Type A, were quite dissatisfied with their own performance under high load conditions.* By subtracting rated satisfaction (more satisfied = higher score) from rated enjoyment (with high enjoyment reflected in a high score, both on seven point scales) a measure of Enjoyment Despite Dissatisfaction with task performance is obtained. A person who greatly enjoys a task despite dissatisfaction with his or her own performance would have a low satisfaction score subtracted from a high enjoyment score (e.g., 7 - 1 = 6) resulting in a high Enjoyment Despite Dissatisfaction value. A person who enjoys the task to the same degree to which he or she does well i.e. to the degree he or she is satisfied with his or her own performance, would produce equivalent satisfaction and enjoyment scores (e.g., 3 - 3 = 0), resulting in an Enjoyment Despite Dissatisfaction value approaching zero. In the rare case where a person may not enjoy the task but is satisfied with his or her performance, the score could reach a negative value.

Data analysis for Enjoyment Despite Dissatisfaction (utilizing the same ANOVA design discussed earlier) produced significant main effects for Complexity ($F = 6.27$, 1/37 df, $p = .016$), and Load ($F = 25.67$, 3/111 df, $p < .001$). The main effect for Type A was marginal ($F = 3.23$, 1/37 df, $p = .077$). A Complexity by Load interaction was equally marginal in level ($F = 2.18$, 3/111 df, $p = .092$); however the Load by Type A interaction did reach conventional

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* Scores on the Satisfaction (7) to Dissatisfaction scale reached average values of about 2 under Load level 8.

levels of significance ($F = 3.07$, 3/111 df, $p = .030$). The graphic representation of the Enjoyment Despite Dissatisfaction data is presented in Figure 4. It appears that the less complex (more unidimensional) subjects and the Type A persons were much more likely to enjoy the task despite their dissatisfaction with their own performance, particularly at higher load levels (where challenges were considerably greater).

On the basis of the data presented above, one might conclude that more unidimensional persons and Type A individuals would be likely to approach challenging and very difficult tasks with vigor and enthusiasm, quite in contrast to their more complex or Type B counterparts. Where vigor, acceptance of challenge and enthusiasm is predictive of success, these people might indeed be potentially more successful. However, the question remains how long this vigor and "enjoyment despite dissatisfaction" would last. The present data were obtained in a laboratory experiment which took a few hours to complete. Performance and satisfaction in real-world work environments are dependent on other factors as well, including the passage of considerably more time. As Streufert, Streufert and Gorson (1981), and Streufert, Streufert and Denson (1982) have shown, Type A and unidimensional information processing are not at all predictive of task success in environments where more complex efforts (such as planning) are required.

Relationship of Task Satisfaction to Job Satisfaction

If we wish to generalize from satisfaction with task performance in an experiment to job satisfaction in the real world, then we need to learn more about the relationship between these two variables. For this purpose, correlations between simple (7 point) job satisfaction/job level satisfaction scales and scales measuring satisfaction with experimental task performance across four load levels were calculated. No particularly

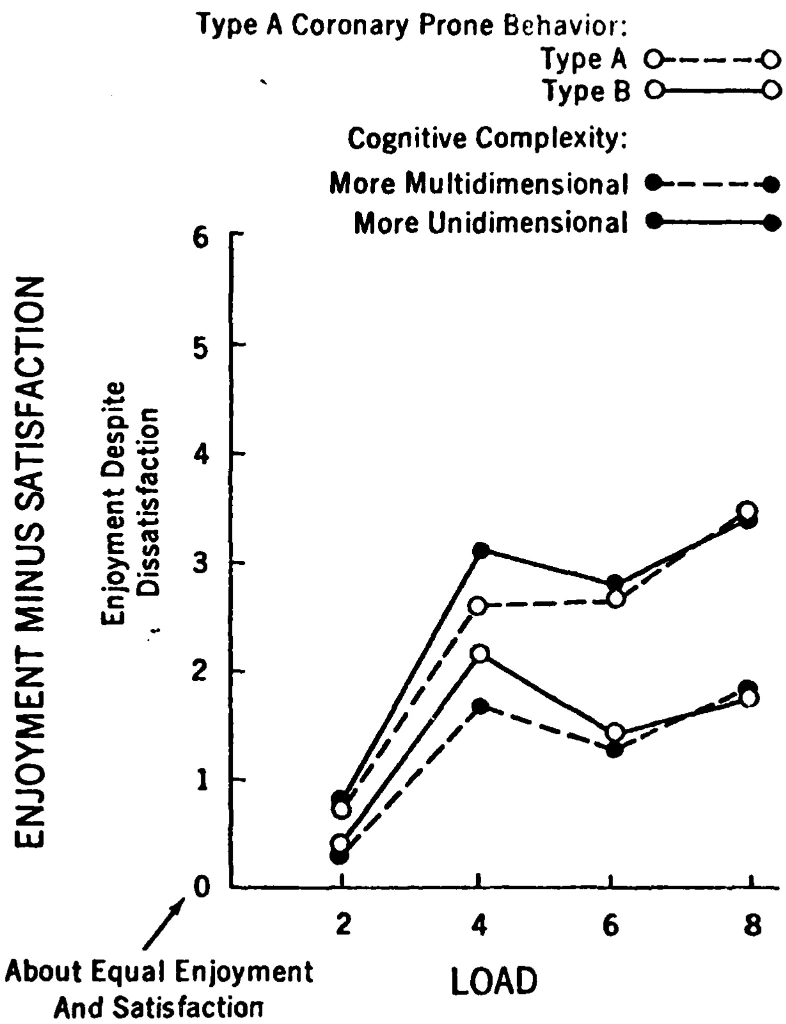


Fig. 4. Effects of Load, Type A and Cognitive Complexity on Enjoyment Despite Dissatisfaction

consistent patterns of changes across load conditions were obtained. Consequently the correlation coefficients were averaged across loads (separately for complex vs. less complex and for Type A vs. Type B subjects). Obtained positive correlations between job and task satisfaction would indicate that persons who tend to be satisfied with their performance on the experimental task would also be likely to be satisfied with their job/job level in the external place of work, and vice versa. A correlation coefficient of r = +.21 between job satisfaction and experimental task satisfaction was obtained for Type B persons. Such a relationship was absent for the Type A participants (r = -.02). Similar levels emerged for the complexity analysis: r = +.21 for complex (multidimensional) participants and r = -.01 for their less complex (more unidimensional) counterparts. The relationship between task satisfaction and job level satisfaction in the world outside of the laboratory, however, was somewhat different. While Type B subjects again showed more congruance between task satisfaction and job level satisfaction than Type A subjects (r = +.15 vs. -.12), cognitively less complex (less multidimensional) persons appeared to show more congruance than their more multidimensional (more complex) counterparts (r = +.18 vs. -.02). Clearly, the correlations are not very high, yet the discrepancies between the congruance obtained for different groups of subjects may be seen as a potential indicant of general feelings of satisfaction vs. dissatisfaction across task and work experiences. The low level of any obtained relationship between task satisfaction in the research and job or job level satisfaction for Type A individuals may once more indicate that challenge might have been more important than experienced difficulty and resulting dissatisfaction. Possibly, the measure of Enjoyment Despite

Dissatisfaction would have been a better predictor of external job satisfaction for these persons. Future research will explore that possibility. In contrast to the Type A persons, Type B individuals produced at least some congruity between task satisfaction in the laboratory and job satisfaction/job level satisfaction. For complex B's, that correlation climbed to values above +.5 for two of the load levels. As observed earlier, the Type B person was generally more satisfied with his performance. With less experienced competitiveness, similar responses to experimental task and job experience might be expected.

Complex persons might be expected to show greater congruance between experimental task satisfaction and external job satisfaction than might be anticipated for their less complex counterparts. For the latter, Enjoyment Despite Dissatisfaction may again be more important. However, that assumption cannot be extended to a comparison of task satisfaction and job level satisfaction. The challenges of a more advanced job should be particularly attractive to the complex person: there are potential new and different dimensions of action involved. Such a challenge would not be contained in higher load levels of the present task, resulting in a potential mismatch between the desire for a higher job level (job level satisfaction) and the lack of excitement about higher loads in a visual-motor task. The absence of any meaningful correlation between job level satisfaction and task satisfaction for complex (multidimensional) participants in the research would be expected from such a view. Future research should and will compare experimental task satisfaction and job satisfaction on the basis of more extensive job satisfaction measurement and will include additional measures of affect and evaluation related to task performance.

In summary, the present data point toward the importance of cognitive style (Complexity and Type A) for the understanding of satisfaction. Moreover, it was shown that satisfaction with task performance and enjoyment of that task are potentially quite different phenomena that may interact differently with stylistic variables. A measure of Enjoyment Despite Dissatisfaction may be particularly useful to discern the motivational characteristics of persons with stylistic differences. While relationships between task satisfaction and job satisfaction that were obtained from the present research are not very high, they nonetheless point again toward stylistic variables as potential mediators of that relationship.

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